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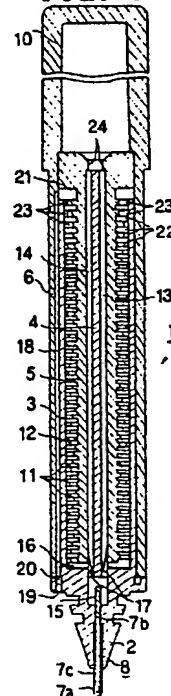
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(54) Writing utensil.

(57) A writing utensil is described which has an outer cylinder (6) provided with an ink tank section (10), and an inner cylinder (3) with one end engaged in the outer cylinder (6). A writing portion (8) is mounted in a pen end portion (2) of the inner cylinder. An intermediate core (5) is disposed in the inner cylinder (3) and around the outer circumference of the intermediate core is a spiral groove which forms an ink reservoir (12), which also communicates with the atmosphere. On a central core (4) are an ink introducing slit (13) and air introducing slit (14) which communicate the ink reservoir (12), the writing portion (8), and the ink tank section (10) with each other.

FIG. 1

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WRITING UTENSIL

This invention relates to a writing utensil, and in particular to a pen in which autograph ink has previously been stored in the ink tank section thereof, whilst the same amount of air as that of the ink consumed during writing can be supplied to the ink tank section.

Conventional writing utensils using low-viscosity ink, particularly ones of raw ink supplying type, have been constructed with an ink tank section is connected to a core for introducing autograph ink into the pen body by means of an ink introducing means such as a groove, whilst an ink reservoir such as bellows is disposed between the ink tank section and a groove for supplying air from the outside so that a serial connection of air supplying groove - ink reservoir - ink tank section - ink introducing groove - ink introducing core is established.

In the construction as described above, when the low-viscosity ink contained in the ink tank section is consumed during writing, internal pressure in the ink tank section decreases so that the same amount of air as that of the ink consumed is supplied to the ink tank section. On one hand, when the internal pressure in the ink tank section increases because of expansion of air or the like due to temperature rise, the ink is pushed out from the ink tank section and reserved in the ink reservoir. And the ink reserved in the ink reservoir is returned to the ink tank section because of the internal pressure drop caused thereafter in the ink tank section.

However, a considerable number of conventional writing utensils having the serial construction of air supplying groove - ink reservoir - ink tank section - ink introducing groove - ink introducing core as described above could not return satisfactorily the ink reserved in the ink reservoir to the ink tank section due to internal pressure drop in the ink tank section. Accordingly, there were problems such as the ink, which was pushed out from the ink tank section into the ink reservoir every time internal pressure built up in the ink tank section, remained unconsumed, also the ink in the ink reservoir soon flowed out from the air supplying groove to the outside.

Furthermore, the extreme end portion of a pen provided with a pen body and a pen introducing core has heretofore been forced into the extreme end of an inner cylinder provided with an ink reservoir, an ink introducing means and the like, so that the ink was easily oozed from between the forced together portions to the outside by capillary action.

According to one aspect of the invention there is provided a writing utensil comprising: an outer cylinder provided with an ink tank section; an inner cylinder with one end engaged in the outer cylinder and having a pen end portion at the other end; a writing portion mounted in the pen end portion; an intermediate core in the inner cylinder and around the outer circumference of which is defined an ink reservoir which communicates with the atmosphere; and ink introducing means and air introducing means within the intermediate core, which communicate the ink reservoir, the writing portion, and the ink tank section with each other.

According to another aspect of the invention there is provided a writing utensil comprising: an outer cylinder provided with an ink tank section; an inner cylinder engaged in the outer cylinder and provided with a pen portion on the extreme end thereof; a writing portion attached to the pen portion; an intermediate core contained in the inner cylinder and formed with an ink reservoir on the outer circumference thereof and which communicates with the atmosphere; a fiber core and an air introducing groove contained inside the intermediate core and communicating mutually with the ink reservoir, the writing portion and the ink tank section; and an outer skin covering the outer circumference of fiber core.

Preferred embodiments of the invention will now be described by way of example and with reference to the accompanying drawings, wherein:

Fig. 1 is a longitudinal sectional view showing a writing utensil, at the center thereof, in accordance with the first embodiment of the present invention;

Fig. 2 is a longitudinal sectional view showing a central core in Fig. 1;

Figs. 3 and 4 are both end views showing the front and rear ends of the central core in Fig. 2, respectively;

Fig. 5 is a longitudinal sectional view showing a modified embodiment of the central core at the center thereof;

Figs. 6 and 7 are both end views showing the front and rear ends of the modified central core in Fig. 5, respectively;

Fig. 8 is a longitudinal section view showing a writing utensil, at the center thereof, in accordance with the second embodiment of the present invention;

Fig. 9 is a longitudinal sectional view showing a writing utensil, at the center thereof, in accordance with the third embodiment of the present invention;

Fig. 10 is a longitudinal sectional view showing a writing utensil, at the center thereof, in accordance with the fourth embodiment of the present invention;

Fig. 11 is a longitudinal sectional view showing a central core in Fig. 10;

Figs. 12 and 13 are both end views showing the front and rear ends of the central core in Fig. 11, respectively;

Fig. 14 is a longitudinal sectional view showing a modified embodiment of the central core in the fourth embodiment at the center thereof;

Figs. 15 and 16 are both end views showing the front and rear ends of the modified central core in Fig. 14, respectively;

Fig. 17 is a longitudinal sectional view showing a writing utensil, at the center thereof, in accordance with the fifth embodiment of the present invention;

Fig. 18 is a longitudinal sectional view showing a central core in Fig. 17;

Fig. 19 is a rear end view of the central core in Fig. 18;

Fig. 20 is a longitudinal sectional view showing a writing utensil, at the center thereof, in accordance with the sixth embodiment of the present invention;

Fig. 21 is a longitudinal sectional view showing a writing utensil, at the center thereof, in accordance with the seventh embodiment of the present invention;

Fig. 22 is a shear plane view of a fiber core and an intermediate core in enlargement in Fig. 21;

Figs. 23 and 24 are shear plane views illustrating modifications of an air introducing groove in Fig. 22, respectively;

Fig. 25 is a longitudinal sectional view showing a writing utensil, at the center thereof, in accordance with the eighth embodiment of the present invention;

Figs 26(a) and 26(b) are plane views of a fiber core and an intermediate core in enlargement in Fig. 25; and

Figs. 27 - 29 are shear plane views illustrating modifications of an air introducing groove in Fig. 6(a), respectively.

The first embodiment of the present invention illustrated in Figs. 1 - 4 will be described in which a writing utensil 1 comprises a pen extreme end portion 2 made of synthetic resin or the like, an inner cylinder 3, a central core 4, an intermediate core 5, and an outer cylinder 6. Disposed at the center of the pen extreme end portion 2 is a pen tip 7a, and an ink introducing core 7b made of a synthetic fiber bundle or the like for introducing ink into the pen tip 7a is inserted into the pen tip 7a from the rear thereof. Thus, a writing portion 8 is composed of the pen tip 7a, the ink introducing

core 7b, and a protective pipe 7c. Furthermore, the inner cylinder 3 is integrally molded on the opposite side to the pen tip 7a in the pen extreme end portion 2. The central core 4 and the intermediate core 5 are concentrically inserted into the inner cylinder 3. The outer cylinder 6 fitted coaxially on the exterior of the inner cylinder 3 is constructed in a cylindrical shape with a bottom formed by closing the end opposite to the pen extreme end portion 2.

And an ink tank section 10 for containing low-viscosity ink is defined inside the outer cylinder 6 at the rear end side, i.e., the end opposite to the pen extreme end portion 2, and an ink reservoir 12 in the form of a spiral groove 11 is defined around the outer circumference of the intermediate core 5. Moreover, defined on the outer periphery of the central core 4 along the longitudinal direction thereof are an ink introducing groove 13 and an air introducing groove 14 communicating the ink introducing core 7b with the ink tank section 10, respectively. These ink and air introducing grooves 13 and 14 are each in the form of a slit or slot defined along the outer circumference of the central core 4 at two diametrically opposed points. The ink introducing groove 13 is a thin slit of, for example, approximately 0.2 mm so as to exhibit good flowability of ink by means of capillary action, whilst the air introducing groove 14 is a thick slit of, for example, approximately 0.3 mm so as to favorably flow air. An insert hole 15 communicating with the ink and air introducing grooves 13 and 14 is defined at the center of the central core 4 on the side of the pen extreme end portion 2, and into the insert hole 15 is inserted the end portion of the ink introducing core 7b on the side of the ink tank section 10. Further a communication hole or space 16 for communicating the ink reservoir 12 with the ink and air introducing grooves 13 and 14 at the side of the pen extreme end portion 2 is defined on the end portion of the intermediate core 5 on the side of the pen extreme end portion 2. This communication hole 16 is connected to an annular groove 17 having a substantially V-shaped section and defined around the outer circumference of the central core 4 on the pen extreme end portion 2 side. An air supplying groove 18 defined on the inner circumference of the outer cylinder 6 along the longitudinal direction thereof is positioned between the inner and outer cylinders 3 and 6. One end of the air supplying groove 18 is communicated with an air supplying port 19 formed on the pen extreme end portion 2, and the other end thereof is communicated with the ink reservoir 12 on the side opposite to that of the pen extreme end portion 2. Furthermore, the opposite ends of the air supplying groove 18 under communicating condition with the air supplying port 19 are connected

with an annular groove 20 defined on the pen extreme end portion 2 as well as an annular groove 21 defined on the ink reservoir 12 on the opposite side to that of the pen extreme end portion 2, respectively. Thus, since the air supplying groove 18 is communicated with the air supplying port 19 by means of the annular groove 20 formed on the extreme end side of the inner cylinder 3, said air supplying groove 18 is positively communicated and connected with said air supplying port 19 without limiting inserting position of the inner cylinder 3.

Moreover, the spiral groove 11 is followed by a plurality of annular grooves 22 defined on the ink reservoir 12 on a portion of the side opposite to that of the pen extreme end portion 2, and spaces between these annular grooves 22 are communicated with each other by means of a plurality of slits 23. The intermediate core 5 and the central core 4 are located by means of a stepped stopper 24 mounted on the intermediate core 5 on the opposite side to that of the pen extreme end portion 2, and the intermediate core 5 and the outer cylinder 6 are sealed in such that the communication of the air supplying groove 18 with the annular groove 21 is not obstructed.

Meanwhile, since the central core 4 and the intermediate core 5 are positively located by means of the stepped stopper 24, they are connected positively with each other so that no play or looseness is observed between these central core 4 and the intermediate core 5 in case of writing and the stability is kept at the time of writing.

Such construction that the communication hole 16 is connected with an annular groove 17, and the opposite ends of the air supplying groove 18 are connected with a pair of the annular grooves 20 and 21, does not need any circumferential location of the pen extreme end portion 2, the inner cylinder 3, the central core 4, the intermediate core 5, and the outer cylinder 6 at the time when the writing utensil 1 is assembled, so that easy assemblage of the writing utensil 1 becomes possible.

Furthermore, a plurality of the annular grooves 22 defined on the ink reservoir 12 at the opposite side to that of the pen extreme end portion 2 and succeeding to the spiral groove 11 as well as a plurality of slits 23 each communicating said annular grooves with each other exhibit sufficient interrupting function with respect to the ink reserved in the spiral groove 11 of the ink reservoir 12 while keeping supplying passage, and as a result such outflow of the ink from the ink reservoir 12 to the side of the air supplying groove 18 can positively be prevented.

The writing utensil 1 is constructed as described above and which contains low-viscosity ink in the ink tank section 10 to utilize the same.

There will be given the operation of the writing utensil according to the above embodiment.

The writing utensil 1 utilizes the low-viscosity ink contained in the ink tank section 10. Upon writing, the ink in the ink tank section 10 is introduced into the pen tip 7a by means of capillary action through the ink introducing groove 13 and the ink introducing core 7b. Due to the consumption of the ink as mentioned above, the internal pressure in the ink tank section 10 decreases so that the same amount of air as that of the ink consumed is supplied to the ink tank section 10 through the air supplying groove 18, the ink reservoir 12, the communication hole 16 and the air introducing groove 14. On the other hand, when the internal pressure increases in the ink tank section 10 because of expansion of air and the like due to temperature rise, the ink is pushed out from the ink tank section 10 to be reserved in the spiral groove 11 or the like of the ink reservoir 12 in good order from the side of the pen extreme end portion 2 via the ink and air introducing grooves 13, 14 - the communication hole 16. Thereafter, when the internal pressure drops in the ink tank section 10, air is smoothly supplied from the air supplying groove 18 to the ink reservoir 12 at the side opposite to that of the pen extreme end portion 2, and as a result the ink reserved in the ink reservoir 12 at the pen extreme end portion 2 side is promptly returned to the ink tank section 10 through the communication hole 16 and the ink and air introducing grooves 13, 14. In addition, even if the ink remains in the ink reservoir 12 at the side of the pen extreme end portion 2, such ink can be directly introduced into the pen tip 7a as it is via the communication hole 16, the ink introducing groove 13 and the ink introducing core 7b to be positively consumed by means of both maintenance of the air supplying passage for the air supplying groove 18 - the ink reservoir 12 - the communication hole 16 - the air introducing groove 14 - the ink tank section 10 and capillary action without returning the ink in the ink reservoir 12 at the pen extreme end portion 2 side to the ink tank section 10.

Next, referring to Figs. 5 - 7, there is shown a modification of the central core 4 in the writing utensil 1 wherein two ink introducing grooves 13 are defined on the periphery of the central core 4 along the longitudinal direction thereof in addition to one air introducing groove 14. Thus, flow of ink becomes better in this modification by means of two ink introducing grooves 13.

As mentioned above, while the embodiment of the present invention has been described, the invention is not limited to this specified example and various effective modifications may be made.

For example, the ink reservoir 12 is not limited to the spiral groove 11, but it may be either a plurality of slits and the like, or a groove filled with an ink absorbing material such as sponge or the like.

Furthermore, the ink and air introducing grooves 13 and 14 defined on the central core 4 are not limited to slits, but the slits may be used in combination with through holes.

As described above, in accordance with the writing utensil using low-viscosity ink of the present invention, such ink pushed out from the ink tank section because of internal pressure buildup in the ink tank section is reserved in the ink reservoir from the side of the pen extreme end portion in good order, so that the ink in the ink reservoir can be returned promptly from the pen extreme end portion side to the ink tank section in the case when the internal pressure drops in the ink tank section. Besides, even if the ink remains in the ink reservoir at the side of the pen extreme end portion, such ink can be directly introduced into the pen body by leaving the same untouched to be positively consumed by means of maintenance of the air supplying passage towards the ink tank section as well as capillary action without returning the ink in the ink reservoir at the pen extreme end portion side to the ink tank section. Thus, the ink contained in the ink tank section can be completely and positively consumed and in addition, no outflow of the ink through the air supplying groove is observed.

Furthermore, according to the writing utensil utilizing low-viscosity ink of the present invention, since the pen extreme end portion is constructed integrally with the inner cylinder, there is no oozing of ink from the press fitting portion of these members unlike conventional writing utensils.

Fig. 8 illustrates the second embodiment of the present invention which is the same writing utensil as that of the first example except for the position where an air supplying groove 18 is formed. More specifically, the air supplying groove 18 has been defined on the inner circumference of the outer cylinder 6 in the first embodiment, whilst the air supplying groove 18 is defined on the outer circumference of an inner cylinder 3 in the second embodiment. As a result, the second embodiment exhibits the quite same functions as those of the first embodiment, so that the same advantages as those of the first embodiment are obtained in the present second embodiment.

Fig. 9 illustrates the third embodiment of the present invention in which only a different point from that of the above-mentioned first embodiment resides in that an air supplying groove 18 is

passed through the wall of an outer cylinder 6 to communicate with an annular groove 21. Hence the third embodiment exhibits also the same advantages with those of the first embodiment.

Fig. 10 illustrates a fourth embodiment wherein cutting chips are used for a writing portion 8 in which the same reference characters designate like or corresponding parts throughout Figs. 1 - 4.

In the present embodiment, an ink introducing core 7b for introducing ink into a pen tip 7a is made of, for example, a chemical fiber such as polyester fiber and the like.

Furthermore, in the present embodiment, the extreme end of the central core 4 abuts upon the rear end of an ink introducing core 7b.

Figs. 11 through 16 show modified constructions of the central core 4 in the present embodiment in each of which an ink introducing groove or grooves 13 and an air introducing groove 14 are defined on the outer circumference of the central core 4 for communicating the writing portion 8 with an ink tank section 10 as in the above embodiments.

The other parts of the construction are the same as those of the above-mentioned embodiments, so that the same advantages are obtained.

Fig. 17 illustrates the fifth embodiment in which the present invention has been applied to a fountain pen wherein the same reference characters designate like or corresponding parts throughout Figs. 1 - 4.

In the present embodiment, a central core 4 is integrally formed with a writing portion 8 having a pen tip 7a. On the outer circumference of the central core 4, an ink introducing groove 13 and an air introducing groove 14 are defined for communicating the writing portion 8 with the ink tank section 10. In the present example, the ink introducing groove 14 is formed so as to extend to the under surface of the pen tip 7a as shown in Figs. 17 and 18.

The parts of the construction other than those described above are the same as the above-mentioned embodiments, so that the same advantages are obtained.

Fig. 20 illustrates the sixth embodiment in which the present invention has been applied to a marking pen or felt-tip pen wherein the same reference characters designate like or corresponding parts throughout Figs. 1 - 4.

In the present embodiment, an ink introducing core 7b is made of, for example, a fiber core pen (prepared by resin-treating the fiber) or a plastic pen (pen made of the plastic in which radial holes are defined at the center thereof or longitudinal grooves and the like are defined on the outer circumference thereof, or both the holes and grooves are defined thereon).

Defined also on a central core 4 in the present embodiment as mentioned above are an ink introducing groove 13 and an air introducing groove 14 composed of arbitrary number of slits.

The parts of the construction other than those described above are the same as the above-mentioned embodiments, so that the same advantages are obtained.

Figs. 21 and 22 show the seventh embodiment of the writing utensil according to this invention.

In this embodiment, the fiber core 25 is made of a synthetic fiber bundle of a continuous length. The end of an ink introducing core 7b on the side of the ink tank section 10 is mounted by the end portion of the fiber core 25 on the side of a pen extreme end portion 2 through an insert hole 15 defined at the center of the fiber core 25. Furthermore, the end portion of the fiber core 25 on the side of the ink tank section 10 is communicated with the ink tank section 10 through a communication hole 17 defined at the center of the intermediate core 5.

And an air introducing groove 14 communicating the ink tank section 10 with the ink reservoir 12 is defined on an inner circumferential surface 5a of the intermediate core 5. The air introducing groove 14 on the side of the pen extreme end portion 2 is communicated to the ink reservoir 12 on the side of the pen extreme end portion through a communication hole 16 defined on the end portion of the intermediate core 5 on the side of the pen extreme end portion 2. Furthermore, the end portion of the air introducing groove 14 on the side of the ink tank section 10 is communicated with the ink tank section 10 through the end portion of the fiber core 25 on the side of the ink tank section 10 and the communication hole 17.

And the fiber core 25 of this writing utensil 1 fluidizes ink by means of capillary action which is due to minute and a large amount of gaps existing among the ink tank section 10, the writing portion 8 and the ink reservoir 12. Thus, an excess of ink does not flow out to a pen tip 7a during a writing operation, so that there is no fear of dripping ink from the pen tip 7a. On one hand, ink is smoothly flowed into the pen body 7a by means of capillary action in case of a writing operation.

Next, Figs. 23 and 24 illustrate modifications of the air introducing groove 14 of the writing utensil 1 wherein, for example, two rib-like projections 26 are integrally formed on the inner circumferential surface 5a of the intermediate core 5 along the axial direction thereof, and a spacing defined in between these projections 26 along the opposite sides thereof is used as an air introducing groove 14 in Fig. 23. In this case, the projection 26 may be a plurality of small projections aligned with a certain

spacing along the axial direction of the intermediate core 5. Furthermore, in Fig. 24, a slit defined on the fiber core 25 itself is utilized as an air introducing groove 14.

In the eighth embodiment, as shown in Figs. 25 and 26 wherein the same reference characters designate the same parts in Figs. 21 - 24, an outer circumferential portion of the fiber core 25 according to the abovementioned first invention is covered with an outer skin composed of, for example, a synthetic resin tube. In the present embodiment, the air introducing groove 14 is defined on the inner circumferential surface 27a of the outer skin 27.

Furthermore, in the present embodiment, the intermediate core 5 and the fiber core 25 as well as the outer skin 27 are located by means of a stepped stopper 24 mounted on the intermediate core 5 on the side opposite to that of the pen extreme end portion 2, and the intermediate core 5 and an outer cylinder 6 are sealed so as not to close a communicating state of an air supplying groove 18 and an annular groove 21.

This embodiment of the present invention functions similarly as in the case of the above-mentioned embodiment. Moreover, since the outer circumference of the fiber core 25 is covered with the outer skin 27 in the second invention, there is no case where the fiber core 25 is dispersed separately. As a result, the fiber core 25 can easily be incorporated into an intermediate cylinder 5 in case of assembling the writing utensil 1, whereby such writing utensil 1 is easily assembled.

Next, Figs. 27 - 29 illustrate modifications of the air introducing groove 14 of the writing utensil 1 wherein, for example, two rib-like projections 27b are integrally formed on the inner circumferential surface 13a of the outer skin 27 along the axial direction thereof, and a spacing defined in between these projections 27b along the opposite sides thereof is used as an air introducing groove 14 in Fig. 27. In this case, the projections 27b may be a plurality of small projections aligned with a certain spacing along the axial direction of the intermediate core 5. Furthermore, in Fig. 28, a slit defined on the fiber core 25 itself is utilized as an air introducing groove 14. In Fig. 29, a concavity is defined on the outer circumferential surface 27c of the outer skin 27 and an air introducing groove 14 is formed along the inside of the intermediate core 5 by utilizing such concavity.

As described above, the present invention has such advantages that the ink flowed out at the time when internal pressure increases in the ink tank section is reserved tentatively in the ink reservoir, whilst such ink can be returned to the ink tank section in the case when the internal pressure is in

ordinary state, and further that the ink which could not have been returned yet to the ink tank section can be used for writing without any additional operation.

In addition, according to the just described embodiments of the inventions, since the ink tank section-the writing portion-the ink reservoir are communicated by a fiber core, ink is smoothly fluidized among the above members by means of capillary action so that there is no fear of dripping ink in case of a writing operation, besides ink can be smoothly flowed out from the writing portion in case of a writing operation. Thus, the writing utensils according to these inventions provide such advantages of high safety and excellent writing property.

Moreover, in accordance with the later embodiments, although the writing utensil utilizes a fiber core which is easily dispersed, such writing utensil can be easily assembled.

Moreover, the fiber core according to the present embodiments fluidizes ink among the ink tank section-the writing portion-the ink reservoir by means of capillary action which is due to minute and a large amount of gaps, so that an excess of ink does not flow out to the writing portion in case of a writing operation and therefore, there is no fear of dripping ink, while ink flows smoothly into the writing portion by capillary action in case of a writing operation.

In addition, the embodiment involves such a characteristic feature that the outer circumference of the fiber core is covered with an outer skin other than the above-mentioned characteristic functions. As a result, the fiber core is hardly dispersed in the case when such fiber core is incorporated into the interior of the intermediate core, whereby the writing utensil can easily be assembled.

As described above, the present invention has such advantages that the ink flowed out at the time when internal pressure increases in the ink tank section is reserved tentatively in the ink reservoir, whilst such ink can be returned to the ink tank section in the case when the internal pressure is in ordinary state, and further that the ink which could not have been returned yet to the ink tank section can be used for writing without any additional operation.

Claims

1. A writing utensil comprising: an outer cylinder (6) provided with an ink tank section (10); an inner cylinder (3) with one end engaged in the outer cylinder (6) and having a pen end portion (2) at the other end; a writing portion (8) mounted in the pen end portion; an intermediate core (5) in the

inner cylinder (3) and around the outer circumference of which is defined an ink reservoir (12) which communicates with the atmosphere; and ink introducing means (13) and air introducing means (14) within the intermediate core (5) which communicate the ink reservoir (12), the writing portion (8), and the ink tank section (10) with each other.

2. A writing utensil as claimed in claim 1, wherein the ink introducing means (13) and air introducing means (14) are formed on a central core (4) disposed within the intermediate core (5).

3. A writing utensil as claimed in claim 1 or 2, wherein the ink introducing means is a groove (13), and/or the air introducing means is a groove (14).

4. A writing utensil as claimed in claim 2, wherein ink introducing means and the air introducing means are axially extending slits (13, 14) on the outer circumference of the central core (4).

5. A writing utensil as claimed in claim 2 or 4, wherein the ink introducing means is in the form of a plurality of axially extending slits (13) on the outer circumference of the central core (4).

6. A writing utensil as claimed in any of claims 1 to 5 wherein the ink reservoir (12) is constructed in the form of a spiral groove (11).

7. A writing utensil as claimed in any of claims 2, 4 or 5, wherein the intermediate core (5) and the central core (4) are located by means of a stepped stopper (24) disposed on the intermediate core at the end opposite to that adjacent the pen end portion of the inner cylinder.

8. A writing utensil as claimed in any of claims 1 to 6 wherein an annular groove (20) is formed on said inner cylinder in the vicinity of the pen end portion (2), and the annular groove (20) is connected to an air supply passage (18) defined in or on the outer cylinder (6) and which communicates with the ink reservoir (12).

9. A writing utensil as claimed in claim 1 wherein the ink introducing means is a fiber core (25).

10. A writing utensil as claimed in claim 9, wherein the air introducing means is a groove (24) defined on an inner surface of the intermediate core or on the fiber core (25).

11. A writing utensil as claimed in any preceding claim, wherein any one of ball point pen, fountain pen, cutting chips, and marking pen is utilised as said writing portion (8).

12. A writing utensil comprising: an outer cylinder (6) provided with an ink tank section (10); an inner cylinder (3) engaged in the outer cylinder (6) and provided with a pen portion (2) on the extreme end thereof; a writing portion (8) attached to the pen end portion (2); an intermediate core (5) contained in the inner cylinder (3) and formed with an ink reservoir (12) on the outer circumference thereof and which communicates with the atmosphere; a

fiber core (25) and an air introducing groove (14) contained inside the intermediate core (5) and communicating mutually with the ink reservoir, the writing portion and the ink tank section; and an outer skin (27) covering the outer circumference of fiber core (25).

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13. A writing utensil as claimed in claim 12, wherein the air introducing groove (14) is defined on the inner surface of the outer skin (27) or on fiber core (25).

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FIG. 1

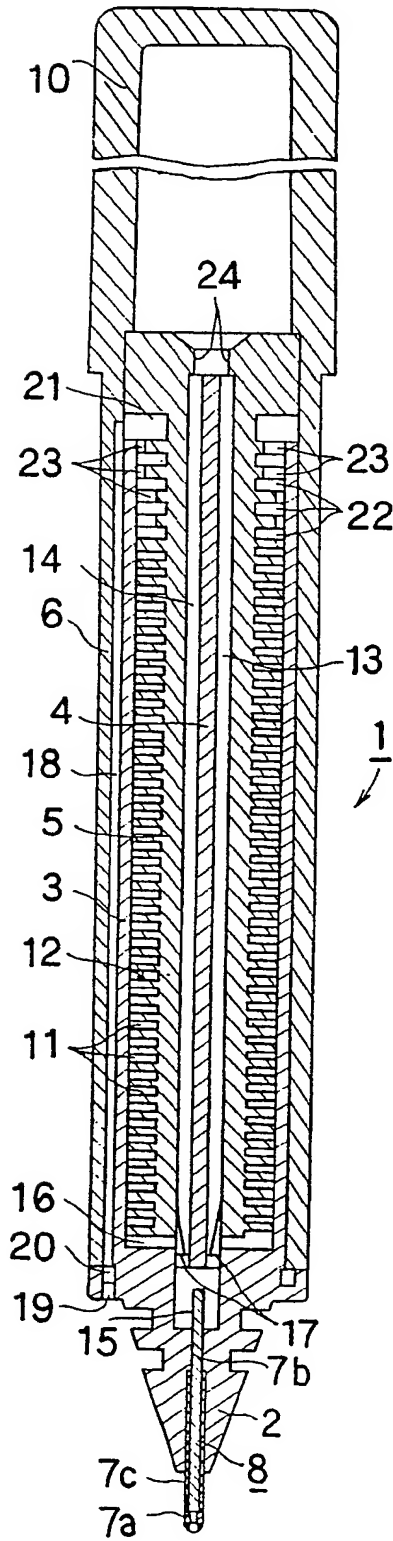


FIG. 4

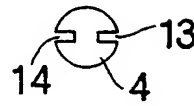


FIG. 7

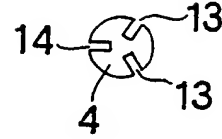


FIG. 2

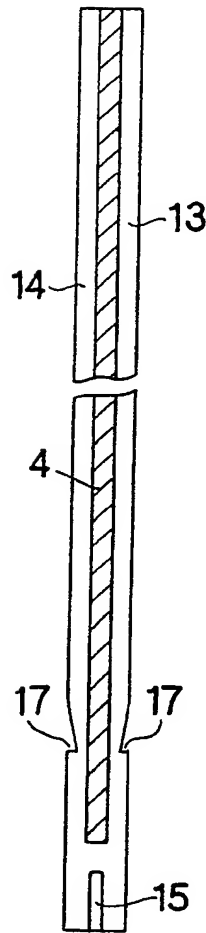


FIG. 5

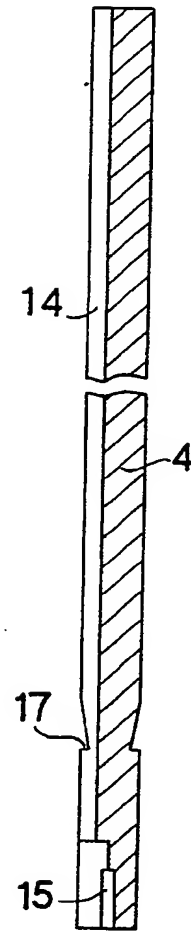


FIG. 3

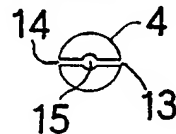
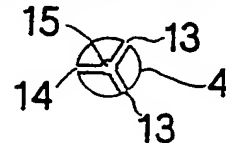


FIG. 6



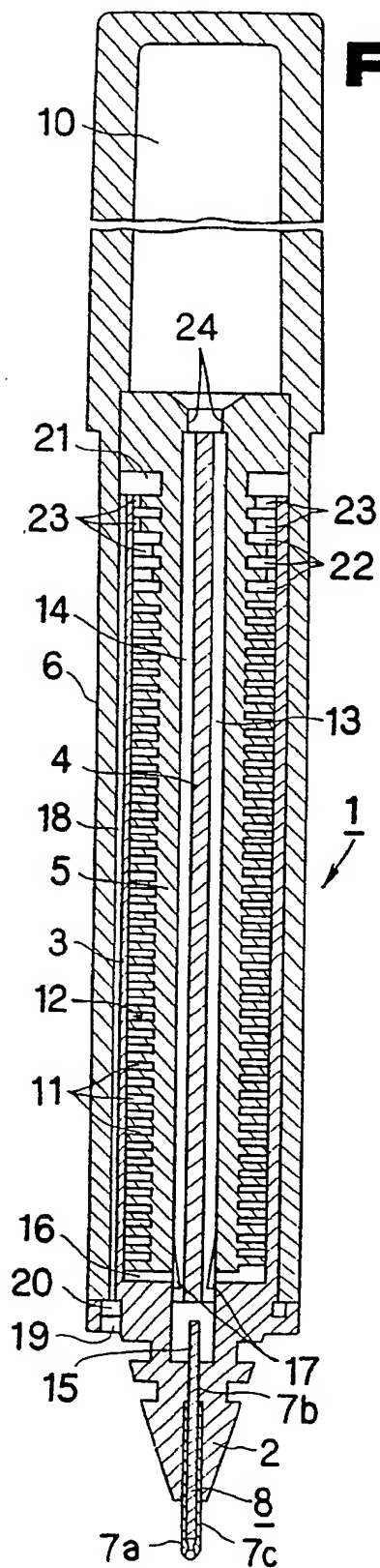


FIG. 8

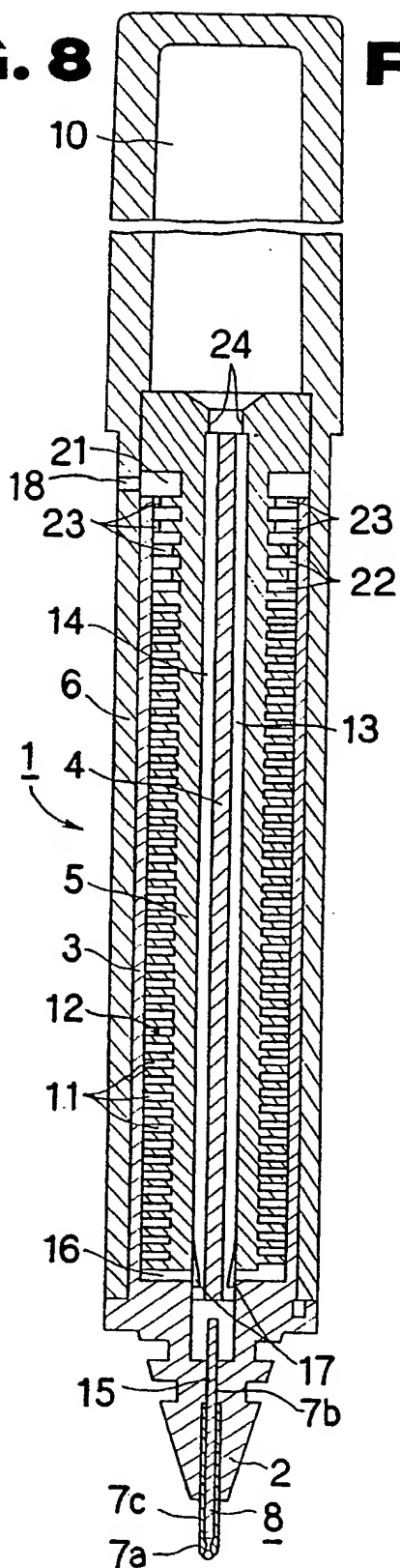


FIG. 9

FIG. 10

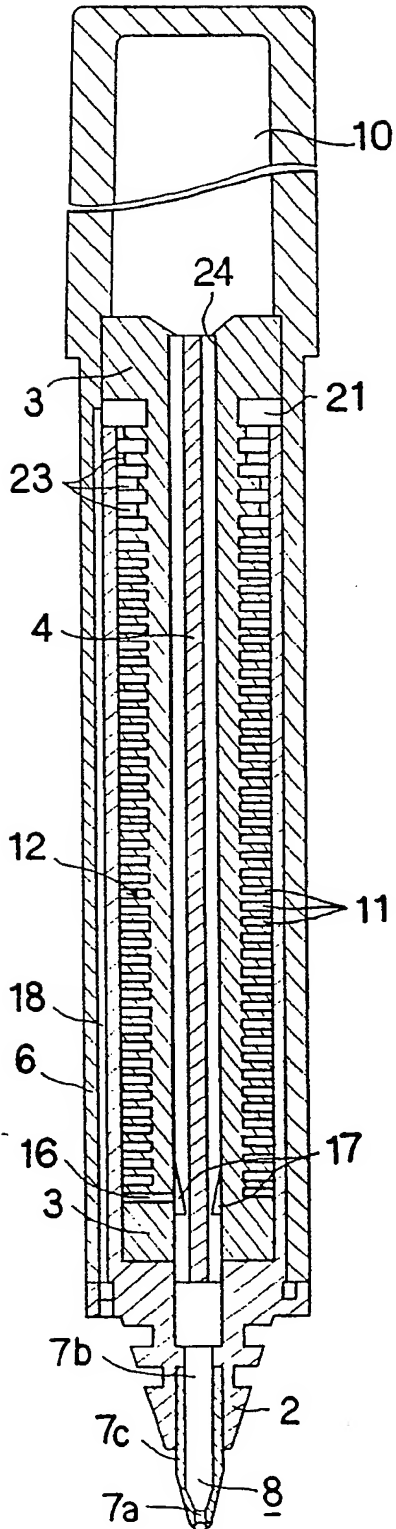


FIG. 13

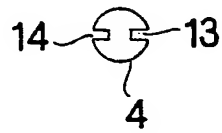


FIG. 16



FIG. 11

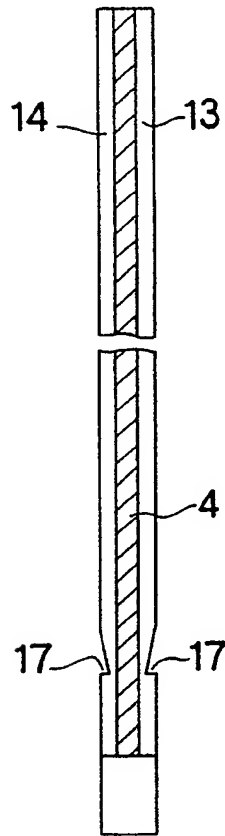


FIG. 14

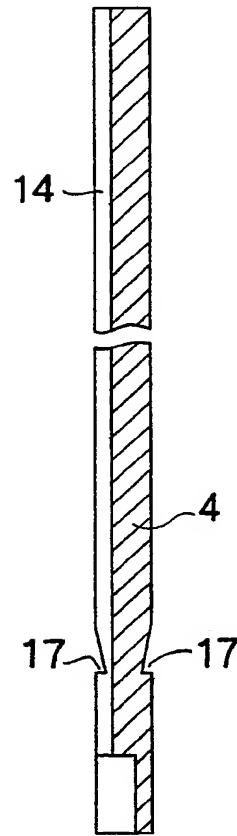


FIG. 12



FIG. 15



FIG. 17

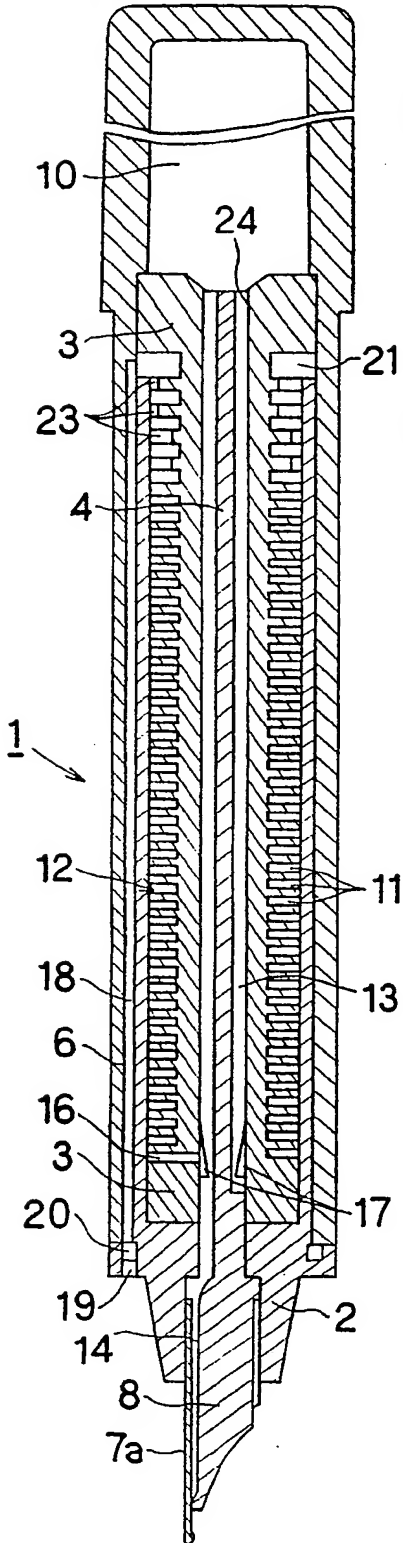


FIG. 19

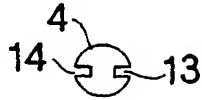


FIG. 18

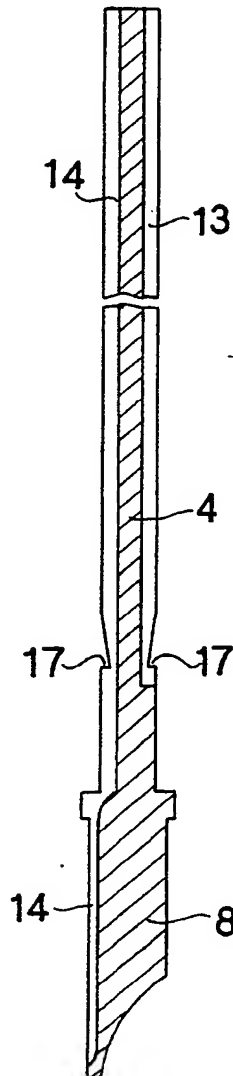


FIG. 20

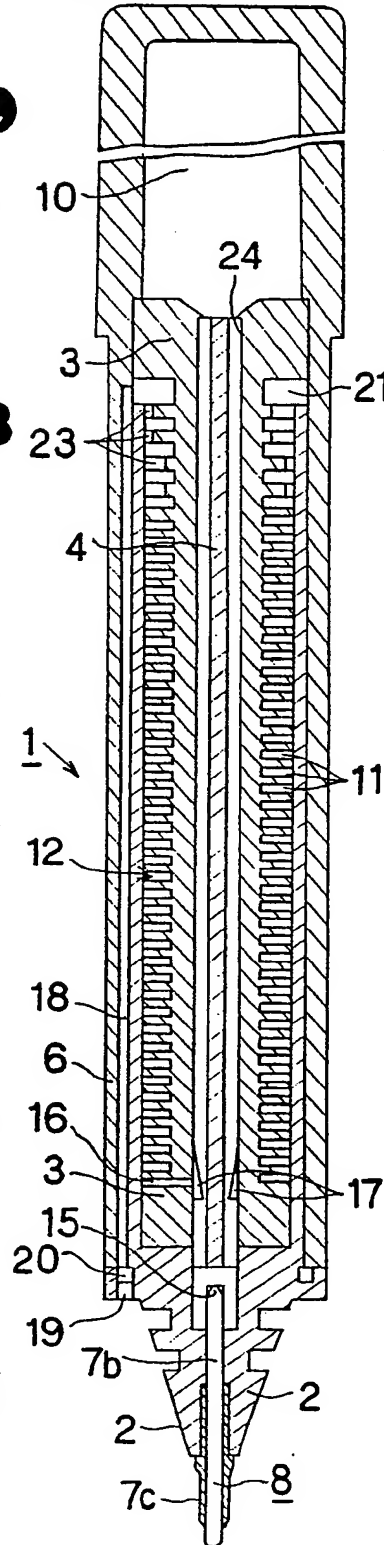


FIG. 21

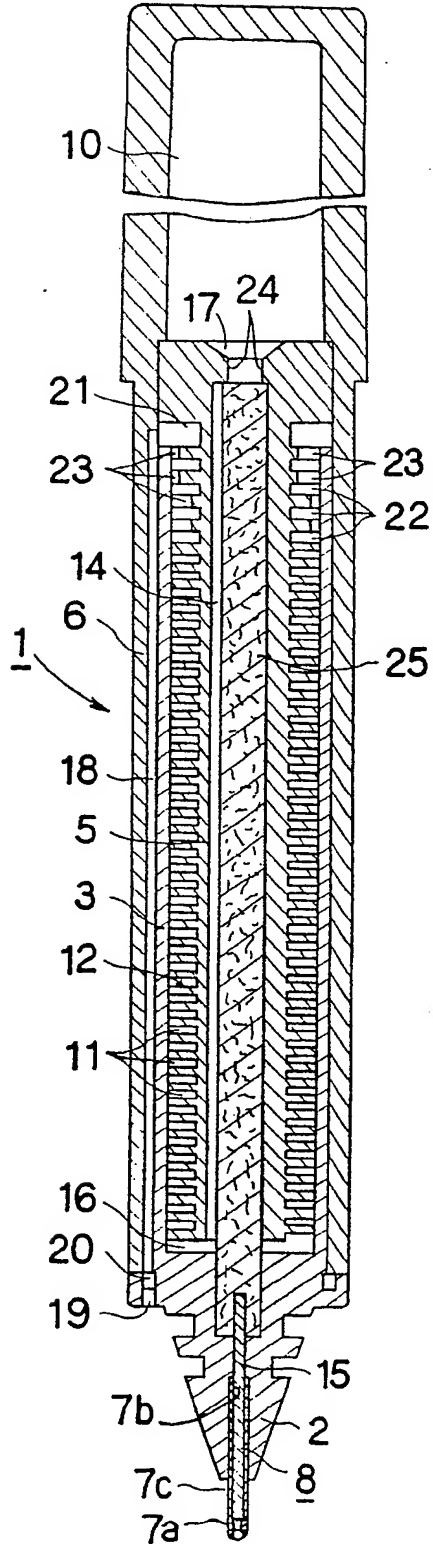


FIG. 22

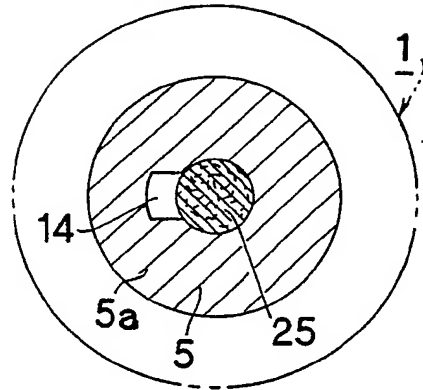


FIG. 23

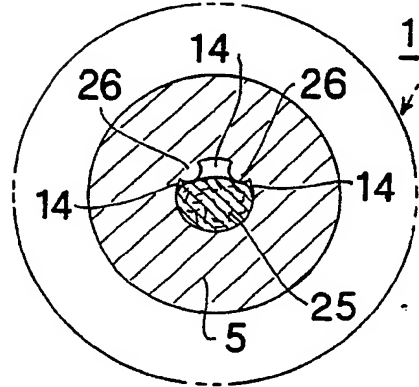


FIG. 24

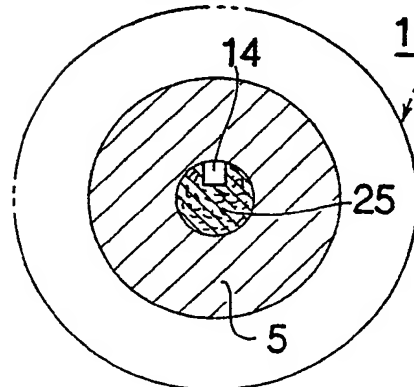


FIG. 25

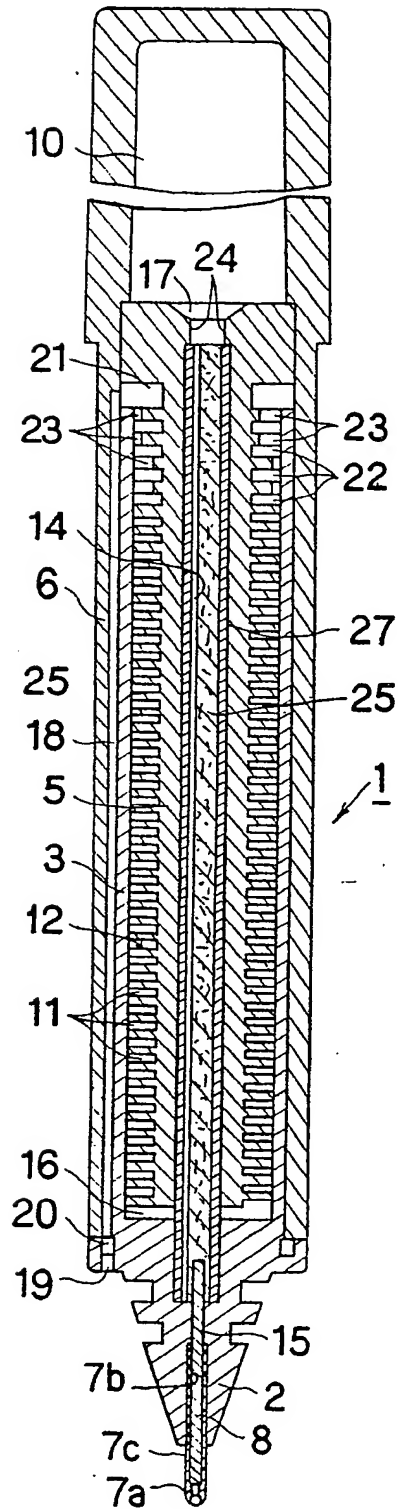


FIG. 26A

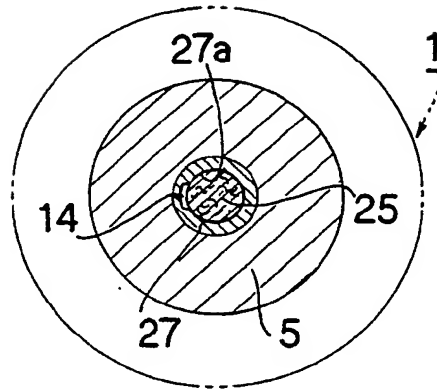


FIG. 26B

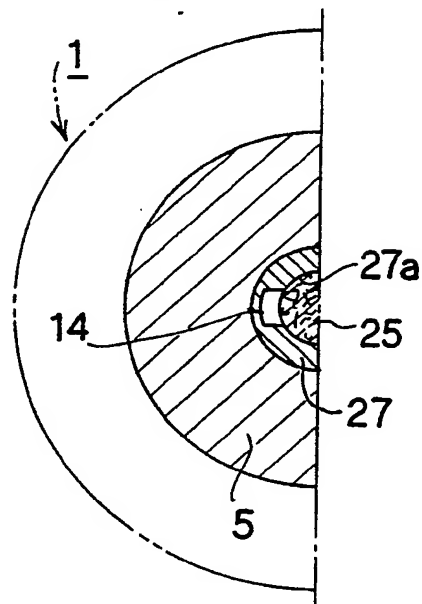


FIG. 27

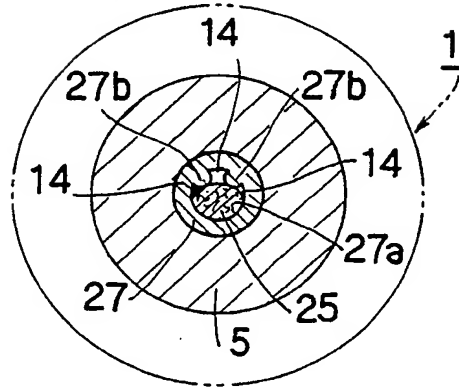


FIG. 28

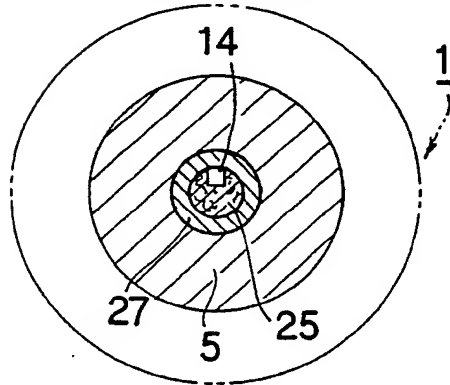
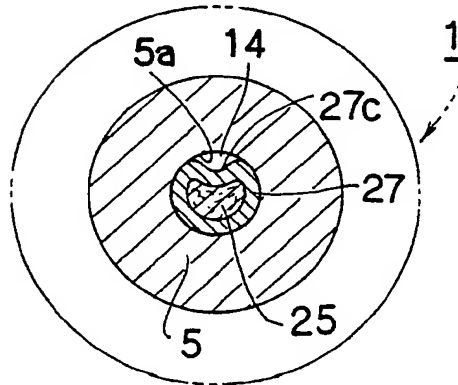


FIG. 29





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	GB-A-1 150 007 (HEBBORN) * Page 2, line 97 - page 5, line 13 in particular figures 9,14 *	1-3,8, 9,11	B 43 K 7/10 B 43 K 5/18
A	---	12	
X	GB-A-2 142 584 (PILOT MAN-NEN HITSU K.K.) * Page 1, line 112 - page 2, line 80 in particular figure 3 *	1,2,11	
A	---	12	
A	GB-A-2 072 587 (ROTRING-WERKE RIEPE KG) * Page 2, line 12 - page 3, line 8 *	12,13	
	---		TECHNICAL FIELDS SEARCHED (Int. Cl.4)
A	DE-A-2 808 910 (FA. PHILIPP MUTSCHLER) * Page 5, line 5 - page 6, line 25 in particular figure 2 *	5	B 43 K
A	DE-A-3 442 331 (WITTE) -----		
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 27-08-1987	Examiner VAN OORSCHOT J.W.M.
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	